

IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for Conservation

Revised and updated 2nd Edition Vol. II



IMPORTANT BIRD AND BIODIVERSITY AREAS IN INDIA

Priority sites for conservation

**Second Edition: Revised and Updated
Volume II**

Asad R. Rahmani, M. Zafar-ul Islam and Raju M. Kasambe

Maps prepared by

Mohit Kalra and Noor I. Khan

Team Members

Noor I. Khan, Siddesh Surve, Abhijit Malekar and Nandkishor Dudhe

Significant Contribution to this edition

**Anwaruddin Choudhury, Arvind Mishra, Ajai Saxena, Dhananjai Mohan, Himmat Singh
Pawar, Intesar Suhail, Khursheed Ahmad, Neeraj Srivastava, P.O. Nameer, Manoj Nair,
Mrutyumjaya Rao, Praveen, J., Sanjeeva Pandey, S. Subramanya, Satya Prakash**

Editors

Gayatri Ugra and Maithreyi, M.R.

Layout and Design

V. Gopi Naidu

With major sponsorship from
Pavillion Foundation, Singapore

Recommended citation:

Rahmani, A.R., Islam, M.Z. and Kasambe, R.M. (2016) Important Bird and Biodiversity Areas in India: Priority Sites for Conservation (Revised and updated). Bombay Natural History Society, Indian Bird Conservation Network, Royal Society for the Protection of Birds and BirdLife International (U.K.). Pp. 1992 + xii

© 2016 Authors.

Bombay Natural History Society,

Hornbill House, Shaheed Bhagat Singh Road, Mumbai-400001, INDIA.

Telephone: 0091-22-28429477 and 0091-22-22821811. Fax: 0091-22-22837615.

Email: info@bnhs.org; websites: www.bnhs.org and www.ibcn.in

Bombay Natural History Society in India is registered under Bombay Public Trust Act 1950: F244 (Bom) dated 06th July 1953.

ISBN: 978-93-84678-02-9

Cover Photographs: Design and collage by Gopi Naidu conceptualized by IBA Team.

First published: 2004 by IBCN: Bombay Natural History Society.

Second Revised Edition: 2016.

Printed by Akshata Arts Pvt Ltd. 22, A to Z Industrial Estate, G. Kadam Marg, Lower Parel, Mumbai 400 013. Published by the Bombay Natural History Society, Hornbill House, Shaheed Bhagat Singh Road, Mumbai 400 001.

Designed: V. Gopi Naidu.

Available from IBCN and BNHS website as given above.

Declaration:

This book is being uploaded on the IBCN website and the text can be used for educational purposes. The copyright of the photographs used in the book remains with the photographers as mentioned near each photograph and should not be used without their prior permission and consent.

Donations to BNHS are exempt under 80G and 35(1)(ii) of Income Tax Act, 1961.

The presentation of material in this book and geographical designations employed do not imply the expression of any opinion whatsoever on the part of IBCN and BNHS concerning the legal status of any state / country, territory or area, or concerning the delimitation of its frontiers or boundaries.

LAKSHADWEEP



Only 11 out of 36 islands, atolls and coral reefs are inhabited. Nonetheless, human density is 2,015 per sq km, among the highest in India. The archipelago is poor in faunal diversity

The Lakshadweep (8° 15' - 11° 45' North and 72° 00' - 74° 00' East) archipelago is the smallest Union Territory of India. It has a geographical area of 3,200 ha only. It comprises a group of 36 coral islands covering 12 atolls, three reefs and sand banks which are submerged at high tide. Only 11 islands are inhabited, of which Agatti is the most populated. The other populated islands are Amini, Andrott, Bangaram, Bitra, Chetlat, Kadmat, Kalpeni, Kavaratti, Kiltan and Minicoy. Minicoy is the southernmost island of this archipelago which is separated from the rest of the islands by a 9° Channel, about 180 km in width, and from the neighbouring Maldives in the south by an 8° Channel of about 120 km. These islands are irregularly scattered in the south Arabian sea, about 280 km to 480 km west of Kochi on the Kerala coast (Das 2002). The Lakshadweep, Maldivian and Chagos archipelagos form a contiguous mountain ridge in the ocean. This ridge is believed to be a continuation of the Aravalli mountain range of Rajasthan and Gujarat since the late tertiary times (Mukundan 1979).

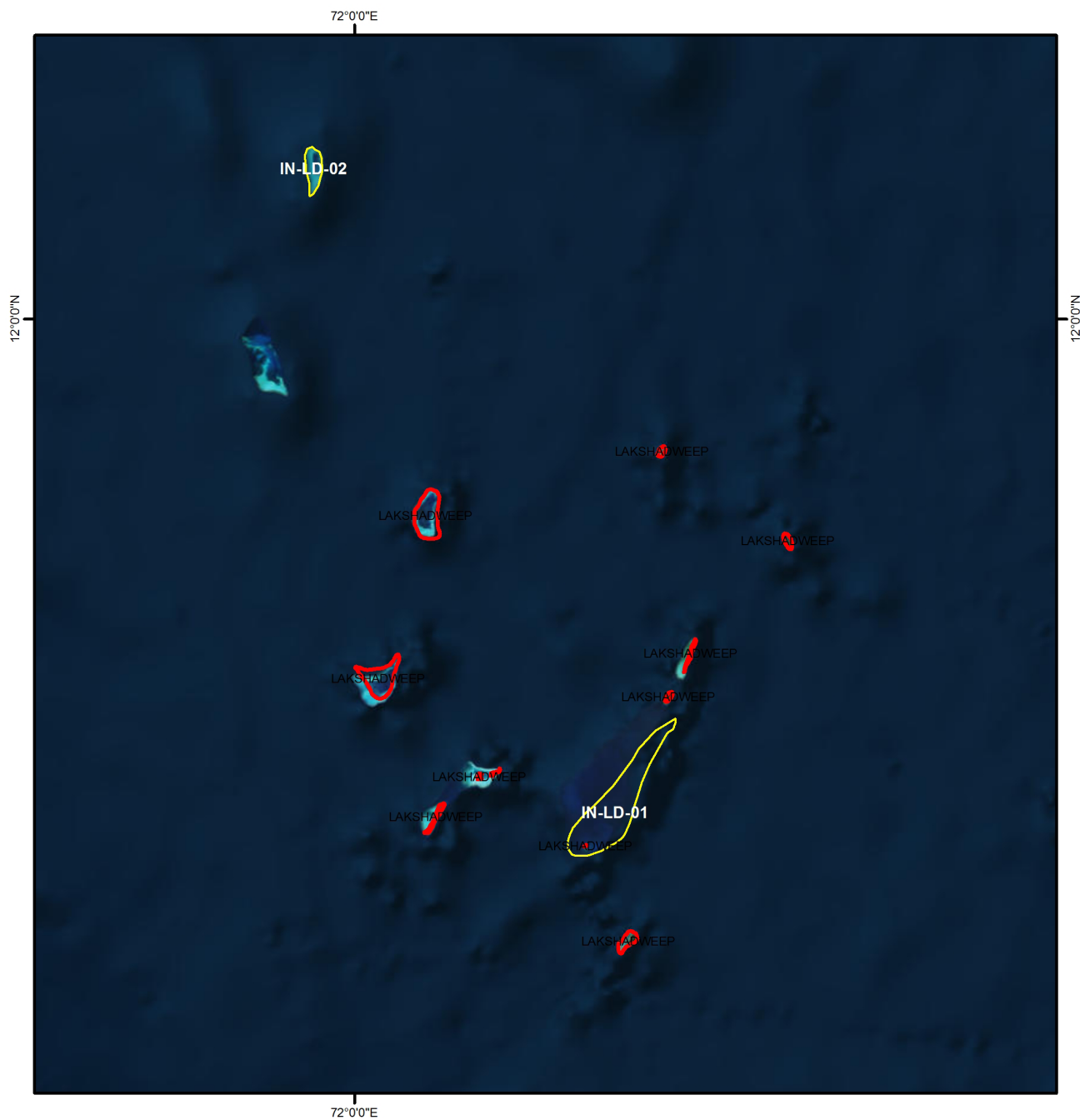
The islands rise upto 5 m above sea level, are mostly flat, enclosed within coral reefs and situated generally on the windward reef on their eastern sides. The atolls and submerged reefs are crescent in shape. There are no natural forests, hillocks, bay creeks, estuaries, rivers, lakes or freshwater tanks on them (Das 2002). The soil of the islands is thin and quite porous, which retains very little moisture and is formed mostly of fragmented coral limestones and sedimentary rocks (Das 2002).



The average rainfall ranges between 1,000 mm to 2,000 mm, under the influence of both the southwest and northeast monsoons. The temperature varies from 17 °C to 37 °C with a slight increase from south to north.


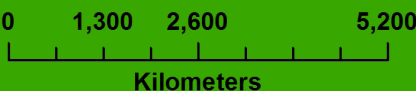
In 2011 census, the population of Lakshadweep was about 0.06 million. Of the total population, 22% is rural and 78% urban with an average population density of 2,015 persons per sq. km. The population is predominantly tribal (95.31%). The people belong to two different language groups (Malayalam in all the islands and Divehi in Minicoy) and are a


Important Bird Areas in Lakshadweep

IN-LD





IBA of Lakshadweep		
IBA site code	IBA site name	IBA criteria
IN-LD-01	Pitti Island	A4iii
IN-LD-02	Beleapani Reef or Cherbaniani Island	A4i, A4iii

well-integrated community (Mathew and Gandhi 2000). The literacy rate is high and over 95% of the population is Muslim and designated as a scheduled tribe. Coconuts and fisheries are the main economic base, with eco-tourism fast catching up. About 1,680 species of birds, reptiles, fish, crustaceans and corals have been reported from this archipelago (Anon. 1991), of which 172 species are terrestrial and the remaining marine. The archipelago is poor in faunal species, probably due to the small area of the landmass, uniform topography, climatic conditions and lack of forest or other habitats (Das 2002). Two species of amphibia, *Bufo melanostictus* and *Hoplobatrachus tigerinus* have been recorded on the Kavaratii and Minicoy islands but they were introduced (Das 2002). Kumar *et al.* (2013) reported first report of Grey Reef Shark *Carcharhinus amblyrhynchos*, a Near Threatened species from the Lakshadweep Archipelago.

Vegetation

The Forest Survey of India report of 2001, records that the territory is devoid of any natural forest. An agro-forestry programme begun in 1988-89 was restricted to the distribution of seedlings to the people.

VULNERABLE	
Great Knot	<i>Calidris tenuirostris</i>
NEAR THREATENED	
Jouanin's Petrel	<i>Bulweria fallax</i>
Eurasian Curlew	<i>Numenius arquata</i>

Terrestrial flora and fauna of the archipelago are poor. No endemic plant species has been reported (Prain 1983). A large number of crop plants (rice, vegetables, fruits, tubers, spices, sugar, arecanut) were introduced from the Indian mainland, along with domestic livestock such as cattle, goats, domestic cats and poultry chicken. Domestic cats and dogs are now a major threat to local fauna.

AVIFAUNA

Two sites have been selected as IBAs i.e. Pitti Island and Beleapani Reef or Cherbaniani Island, mainly on the basis of congregation of nesting seabirds. Pitti Island is an uninhabited barren reef with a sand bank. The island has been known, from the early nineteenth century, to harbour many varieties of terns and numbers have known to cross 20,000. Though some migratory waders are seen on Pitti, terns are the only breeding birds on the island. The tern species that nest in and feed around Pitti are Sooty Tern *Onychoprion fuscatus*, Brown Noddy *Anous stolidus*, Large Crested Tern *Thalasseus bergii*, and Bridled Tern *Onychoprion anaethetus*. Waders reported from Pitti include Ruddy Turnstone *Arenaria interpres*, Eurasian Curlew



ASAD R. RAHMANI

Government of Lakshadweep has put tetrapods to prevent soil erosion. This has created ecological changes on the beaches. Tetrapods also prevents nesting of sea turtles



Inhabited islands of Lakshadweep archipelago have very dense human population.
Most of the natural vegetation has been changed to coconut plantation

Numenius arquata, and Lesser Sand Plover *Charadrius mongolus* (Anon. 1991). The tern colonies play an important role in ecology and economy of islands. The birds feed on *Spratelloides* spp., a small fish species which is favourite food of tuna. People use flocks of foraging terns in sea as tuna indicators. Soils on Pitti and other islands show very high value of phosphate content which indicates the role of terns in nutrient recycling (Mathew *et al.* 1996). Other common bird species includes Red-billed Tropicbird *Phaethon aethereus*, Pomarine Jaeger *Stercorarius pomarinus*, and White-cheeked Tern *Sterna repressa*. The island is devoid of any vegetation.

REFERENCES

- Anonymous (1991) *Pitti Island Lakshadweep an ornithological study*. Madras Naturalist Society, Madras.
- Das, A. K. (2002) Islands. *In: Ecosystems of India*. Eds. Alfred, J. R. B., A. K. Das and A. K. Sanyal. ENVIS. Zoo. Surv. India, Kolkata: 1—410.
- Kumar, K.V.A., Khanolkar, S.P., Pravin, P., Meenakumari, B. & Radhakrishnan, E.V. (2013). First Record of the Grey Reef Shark *Carcharhinus amblyrhynchos*, (Bleeker, 1856) (Carcharhiniformes: Carcharhinidae) from the Lakshadweep Sea, India. *Journal of Threatened Taxa* 5(1): 3580— 3582.
- Mathew, D.N., Mathew, G. & Gandhi, T. (1996) Breeding season and conservation of the Terns *Sterna fuscata* and *Anous stolidus* in the Lakshadweep. *JBNHS* 93: 507—510.
- Mathew, D. N. and Gandhi, T. (2000) Prioritising Sites for Biodiversity Conservation in Lakshadweep Islands. *In: Singh, S., Sastry, A. R. K., Mehta, R & Uppal, V. 'Setting Biodiversity Conservation Priorities for India' WWF- India, New Delhi, xxvii & Pp. 707*
- Mukundan, T. K. (1979) *Lakshadweep – a hundred thousand islands*. Academy Press, New Delhi, 225 pp.
- Prain, D. (1983) Botany of the Laccadives. *J. Bombay Nat. Hist. Soc.* 8: 57—86.

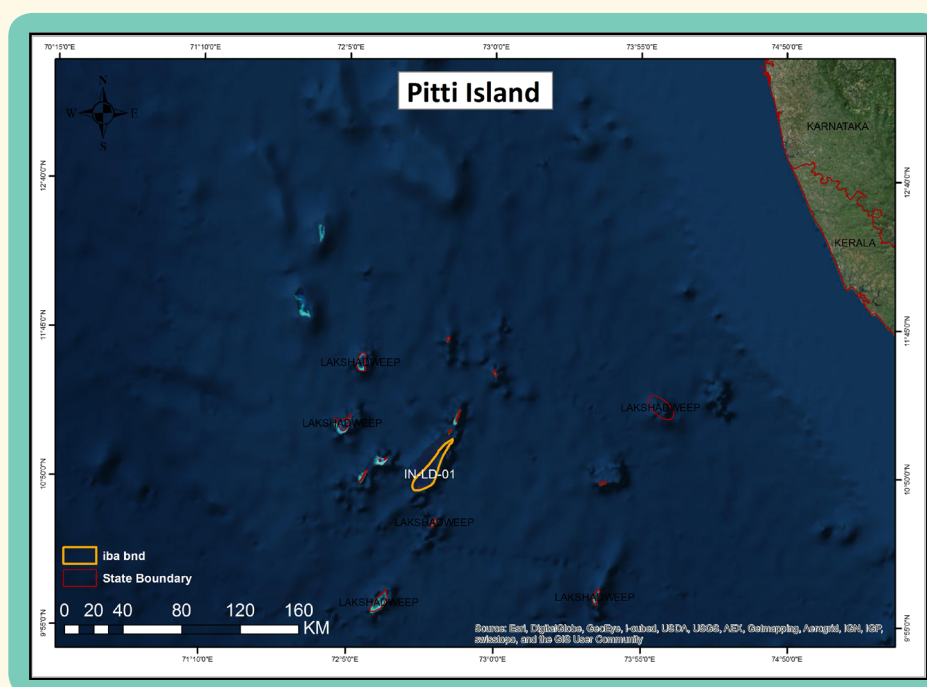
PITTI ISLAND

IN-LD-01

IBA Site Code	: IN-LD-01	Area	: 1.21 ha
Administrative Region (State)	: Lakshadweep Islands	Altitude	: 2–6 msl
District	: Lakshadweep Islands	Rainfall	: 1,500 mm
Coordinates	: 10° 46' 54" N, 73° 31' 59" E	Temperature	: 17 °C to 38 °C
Ownership	: State	Biogeographic Zone	: Islands
		Habitats	: Sandy Island, Reef

IBA CRITERIA: A4iii (≥20,000 waterbirds)

PROTECTION STATUS: Not officially protected.



GENERAL DESCRIPTION

Pitti Island is an uninhabited, barren reef with a sand-bank located in the Lakshadweep archipelago, the smallest Union Territory of India, in the Arabian Sea, 280-480 km away from the city of Kochi (Cochin) in Kerala, India. The island is mostly made up of broken coral that has been pounded to a rough sand like consistency, with large boulders and loose stones. The island is a low plateau rising c. 2 m above msl at high tide, with sloping beaches all around. The island was formed by the accumulation of coral sand in the form of a sandbank with the action of the wind waves and currents (Anon. 1991).

AVIFAUNA

The island has been known from the early 19th century to harbour many varieties of terns, with numbers known to exceed 20,000 individuals. 67 species of birds are recorded in Lakshadweep archipelago by Daniels (1991) and 82 species

of bird by Kurup and Zacharias (1994). Pitti is the breeding ground for four species of terns: Sooty Tern *Sterna fuscata*, Great Crested Tern *S. bergii*, Bridled Tern *S. anaethetus* and Brown Noddy *Anous stolidus* (Betts 1938, Kurup and Zacharias 1994). This island is of great importance as breeding colonies of pelagic birds are rare in the Indian territory (Anon. 1991). Though some migratory waders are seen on Pitti, terns are the only breeding birds on the islands. Waders reported from Pitti include the Ruddy Turnstone *Arenaria interpres*, Eurasian Curlew *Numenius arquata*, and Lesser Sand Plover *Charadrius mongolus* (Anon. 1991). The island is devoid of vegetation.

A study by the Madras Naturalist Society (MNS) estimated the number of terns present at 20,000 in October 1963, 12,000 in February 1978, 4,000 in May 1990, 2,000 in February 1991 and 8,000 in April 1991. Bridled Terns were not seen during the MNS survey, but were observed flying very close to Pitti Island during November 2001.



ASAD R. RAHMANI

Pitti Island is the breeding ground for four pelagic terns - Sooty Tern *Sterna fuscata*, Great Crested Tern *S. bergii*, Bridled Tern *S. anaethetus* and Brown Noddy *Anous stolidus*

LAND USE

- Nature conservation and research

THREATS AND CONSERVATION ISSUES

- Disturbance to birds
- Natural disasters
- Unsustainable exploitation of eggs

Mathew *et al.* (1996) reported that collection of tern eggs from Pitti Island reached unsustainable levels, causing decline in the number of terns.

Although the island is uninhabited, fishermen from other islands in Lakshadweep visit it for fishing, collecting shells and tern eggs (Anon. 1991). This poses a severe threat to the colony throughout the year, except during the monsoon when the island becomes inaccessible to human beings. Heavy rains, however, take their toll on the chicks, and mortality is very high. Predation by crabs is another natural threat to

the bird eggs. Introduction of vegetation has been suggested on Pitti Island (Anon. 1991), but this would be disastrous to the nesting colony of terns.

KEY REFERENCES

- Anon (1991) Pitti Island, Lakshadweep: an ornithological study. Madras Naturalist Society, Madras.
- Betts, F. N. (1938) The breeding of the Indian Sooty Tern (*Sterna fuscata infusata*) in the Laccadive Islands. *J. Bombay Nat. Hist. Soc* 40: 382–387.
- Daniels, R. J. R (1991) Island biogeography of birds of the Lakshadweep archipelago, Indian Ocean. *J. Bombay Nat. Hist. Soc.* 88:320–328.
- Kurup, D. N. and Zacharias, V. J. (1994) Birds of Lakshadweep Islands. *Forktail* 10: 49–64.
- Mathew, D. N., Mathew, G. and Gandhi, T. (1996) Breeding season of the terns *Sterna fuscata* and *Anous stolidus* in the Lakshadweep. *J. Bombay Nat. Hist. Soc.* 93: 507–510.

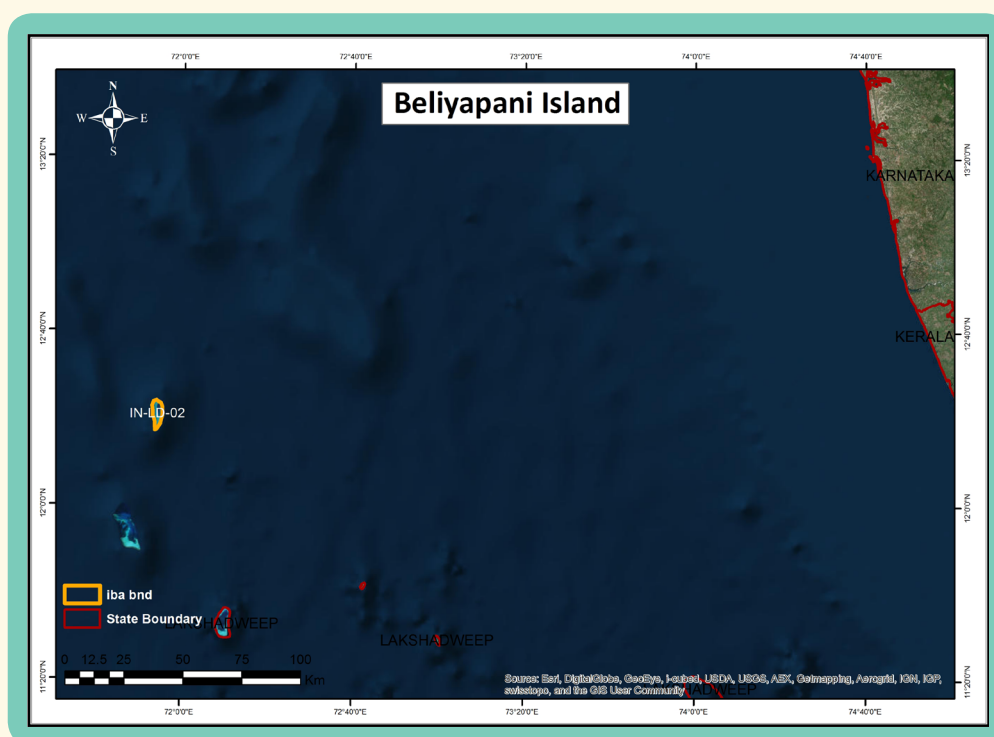
BELIYAPANI ISLAND

IBA Site Code	: IN--LD--02	Area	: ??????????
Administrative Region (State)	: Union Territory of Lakshadweep	Altitude	: 2 m
District	: Union Territory of Lakshadweep	Rainfall	: Not known
Coordinates	: ?????????????	Temperature	: 17 °C to 38 °C
		Biogeographic Zone	: Islands

IN-LD-02

IBA CRITERIA: A4ii (site known or thought to hold, on a regular basis, >1% of the global population of a congregatory seabird or terrestrial species), and A4iii (site known or thought to hold, on a regular basis, > 20,000 waterbirds or >10,000 pairs of seabirds of one or more species).

PROTECTION STATUS: Not protected..



GENERAL DESCRIPTION

Beliapani Island (also known as, Cherbaniani Island, or Valiyapanniyam or Baliapannium or Beleapani sand bank) has permanently exposed sand bars, while Cheriapani (also known as Cheriapaniyam or Byramgore reef) is a submerged reef. Only part of reef crest gets exposed periodically. Sand bars of Beliyapani are devoid of any vegetation.

Beliapani reef area: lagoon and lagoon reef: 172.59 sq. km. Cheriapani reef area: lagoon and lagoon reef: 57.64 sq.km. The IBA includes northern cluster of Islands which include Beliyapani (Beliapannium) Island and the foraging areas around Cheriapani (Cheriapanniyam), Bitra, Kiltan and Chetlat. Beli. Beleapani Reef with waters around Chereapani Reef, Bitra, Chetlat, and Kiltan has been identified as a marine Important Bird Area (mIBA) (Kasambe 2012). The

IBA includes an area of 80 km for Sooty Tern, 25 km for Great Crested Tern as foraging range.

AVIFAUNA

Despite its remoteness, the islands and sandbars have been visited by many ornithologists, starting by Hume (1876) who found Bridled Tern *Sterna anaetheta antarctica* in enormous numbers at Cherbaniani in February 1875 in winter plumage. He also found Sooty Terns *S. fuscata* breeding in vast numbers in Cherbaniani in February, and Philippine Noddy *Anous stolidus* beginning to breed at Cherbaniani in the second week of February. He also saw a Booby *Sula fiber* at Cherbaniani. He obtained a specimen of Short-tailed Tropic Bird *Phaethon indicus* near Cherbaniani reef.

Gadow and Gardiner (1903) mentioned 26 species of birds in their work on aves of Laccadive and Maldives. They collected one immature specimen of Sooty Tern *Sterna fuliginosa* from Minikoi (now Minicoy).

Later, Betts (1938) has given an account of the birds of the Lakshadweep Islands. He mentions that Large Crested Terns were numerous on the mainland island. He saw flocks of Sooty Terns *S. fuscata* well out to sea between the islands but never within seven or eight miles of land. Ellis (1924) has recorded Persian Shearwater *Puffinus persicus* as resident of the Lakshadweep Islands.

Mathew and Ambedkar (1964) caught an Ashy Storm Petrel *Oceanodroma leucorhoa monorhis* (Swinh.) between Chetlat and Bitra. They have reported gatherings of a few hundred Brown-winged (Bridled) Terns *Sterna anaethetus* (along with chicks) and Sooty Terns at Beliapani. Pande *et al.* (2007) conducted an ornithological expedition to the Lakshadweep archipelago in March 2006. They reported 5,000 Sooty Terns (with 48% pairs breeding), 1,700 Brown Noddies, 1,900 Large Crested Terns, 760 Lesser Crested Terns and 40 White-cheeked Terns on Cherbaniani Island and found 1,200 eggs.

Pande *et al.* (2007) further mentions that the extensive coconut plantations on several islands like Bitra, Parli 1 and 2, Tinnakara, Suheli Veliyakara and Cheriyaakara have resulted in their being abandoned as nesting sites by seabirds. They have recommended that Cherbaniani (Beliapani Reef), and Suheli Pitti should be immediately declared Marine Birds Sanctuaries. Suheli Pitti though devoid of any pelagic bird nesting, is a potential breeding site for these birds.

The nesting of birds is seen only on Cherbaniani lagoon which has five sand bars that are used by Sooty Tern *Sterna fuscata* and Brown Noddy *Anous stolidus*. The population of these species equals if not more to that of nesting populations of Pitti Island (an IBA). The sand bars are devoid of any trees. Fisherman from Chetlat, Bitra and Kiltan islands, stay on some of these sand bars during the fishing season which is from November till April. Birds however use both Cheriyaapani and Beliapani waters as feeding grounds. There are no study on the population of birds on these islands as they are remotely located and not easily accessible. A.O. Hume in 1875 first reported breeding of Noddy and Sooty Terns on these islands. Subsequently Mr. M. Ramunny, Administrator Lakshadweep and his team in 1963 reported presence of flocks of terns but no chicks.

OTHER KEY FAUNA

Nesting of Green Sea Turtle is common on this island. Hawksbill and Green Sea Turtles are plenty in lagoons and both the species are used as bait for shark fishing. The lagoon and surrounding waters are rich in various species of oceanic sharks, dolphins, and several species of Schedule I and IV of

the Wildlife Protection Act. Whales especially Sperm Whales are seen commonly. Blue Whales are recorded sporadically. Whale sharks are common though seasonally.

CONSERVATION ISSUES

Collection of eggs is intensive especially during winter. However, the reef is completely inaccessible in monsoon. Thus monsoon nesting population is free of human predation. Long-line tuna fishing has recently started around Agatti and Bangaram Islands. It can be a serious threat to the sea birds in near future.

THREATS

Pande, *et al.* (2007) have described the threats to the ecology of these islands. Some of the important threats are:

1. Pitti and Cherbaniani Islands attract local residents for guano collection. During these visits poaching of eggs and trapping of nesting pelagic birds for eating has been documented by several observers in the past (Kurup and Zacharias 1994). Pande *et al.* (2007) also noted heaps of broken eggshells and mounds of feathers confirming that this practice is still prevalent. The entire colony has been earlier ransacked for eggs (Mathew *et al.* 1991).
2. Guano collection is also rampant as evident by more than one dozen plastic bags filled with guano that were recorded on Cherbaniani (Beliapani Reef).
3. Some Sooty Terns were noticed entangled in the frayed and torn edges of plastic guano collection bags.
4. Extensive coconut palm plantations on several islands like Bitra, Parli 1 and 2, Tinnakara, Suheli Veliyakara and Cheriyaakara have resulted in their being abandoned as nesting sites by these birds. Nesting was previously documented in Bitra and Suheli group of islands (Mathew and Ambedkar 1964). Growing human population has clearly put a pressure on the available land and increasingly, uninhabited islands are being opened for human activities. These activities are clearly detrimental to the birds.
5. Opening of Suheli Cheriyaakara to humans has resulted in frequent visits to the adjacent Suheli Pitti Island by people and fishermen and this has driven away nesting pelagic birds from Suheli Pitti as well.
6. Liberal use of rodenticides like 'Roban' (zinc compounds) on several islands like Tinnakara, Parli 1 and 2, and Suheli Veliyakara. The soil samples in some of the islands have shown alarmingly high levels of zinc.
7. Bio-magnification of toxic zinc is probably already occurring since samples of debris from bird carcasses from Pitti Island, which is devoid of any vegetation and an important breeding ground for pelagic birds have also revealed higher than permissible levels of zinc.
8. Dumping of garbage like plastic, used and leaking batteries, electric glass bulbs, bottles, cigarette cartons,

cans, etc., is prevalent on important nesting islands of Pitti and Cherbaniani (Beliyapani Reef).

9. Recurring oil spills, even in small quantities, from fishermen's boats and tourist transport can cause pollution in the long run.
10. Lack of regular monitoring of the nesting islands by competent authorities of Lakshadweep Archipelago and by Coast Guard has resulted in absence of fear in the minds of fishermen who poach the eggs and birds indiscriminately. At present no legal protection is accorded to this important island.
11. Poaching of eggs of marine turtles is known. Local fishermen also kill marine turtles for oil, which is used for painting boats for rendering them water resistant.
12. Putting up tetrapods on coasts and cutting of indigenous vegetation have led to decrease in the availability of sandy beaches for nesting of marine turtles.

Recommendations: (as per Pande *et al.* 2007)

1. Chebaniani (Beliyapani Reef), Byramgore, Suheli Pitti and Pitti Islands should be immediately declared as Marine Birds Sanctuaries. A strict penalty should be levied if unauthorized persons are found on these islands, especially during March and November. Cherabaniani is the second most important breeding ground for the pelagic birds of Lakshadweep archipelago, second only to Pitti Island. Rodgers *et. al* (2000) had also recommended declaration of Beliapani as a sanctuary to conserve the biodiversity of the area.
2. Regular surveillance and monitoring of bird populations on Cherbaniani and Pitti islands should be undertaken.
3. No habitat modifications on these Islands should be permitted and their status quo maintained without starting any coconut or other plantations.
4. Suheli Pitti, though devoid of pelagic bird nesting, is a potential breeding ground of these birds. Entry of people to Suheli Pitti should also be prohibited.
5. The Coast guard should physically patrol Cherbaniani, Byramgore, Pitti and Suheli Pitti Islands, rather than simple distant patrolling. Unless the personnel land on these islands on small boats, true status of pelagic birds cannot be evaluated since the larger petrol vessels cannot approach close enough and hence the bird life and other faunal monitoring or exploitation will remain unknown.
6. Use of rodenticides like 'Roban', should be strictly prohibited in Lakshadweep.
7. Disposal of fish 'Mas' and other vegetative waste like coconut fronds should be correctly carried out in safe manner such that decomposition of these waste products does not increase the pH of water or produce any unfavourable alterations.
8. Creating public awareness on the importance of Chebaniani, Byramgore, Pitti and Suheli Pitti islands in Lakshadweep's ecology should be undertaken on a priority basis. Fishermen should be made aware to refrain from poaching of eggs and birds, and disposing toxic garbage on the islands.
9. Officers and crew of the Coast Guard should be involved in a marine ecology orientation workshop wherein the importance of marine ecosystem with respect to marine birds, mammals, fish, reptiles, flora and other fauna is highlighted in a simpler manner. The immense role of Coast Guard in the protection, conservation and preservation of our natural but fragile marine wealth should be highlighted, since this area is virtually out of bounds to the common man.

KEY CONTRIBUTORS

Deepak Apte, Raju Kasambe.

KEY REFERENCES

- Anonymous (1991) Pitti Island, Lakshadweep: an ornithological study. Madras Naturalist Society, Madras. Pp.34.
- Betts, F.N. (1938) The birds of the \ Laccadive Islands. *JBNHS* 40: 382–387.
- Daniels, R.J.R (1991) Island biogeography and the birds of the Lakshadweep archipelago, Indian Ocean. *JBNHS* 88:320–328.
- Ellis, R.H. (1924) A short account of the Laccadive Islands and Minicoy. P.R. Madras Government Press, Madras. Pp.123.
- Gadow, H. and J. Stanley Gardiner (1903) Aves in "The fauna and Geography of the Maldive and the Laccadive Archipelagoes. Cambridge University Press. Vol.1: 368–373.
- Hume, A.O. (1876) Laccadives and the West Coast. *Stray Feathers* 4 (4, 5, 6): 413–483.
- Islam, Z.A. and Rahmani, A.R. (2004) Important Bird Areas in India: Key sites of conservation. Indian Bird Conservation Network, Bombay Natural History Society and BirdLife International, Mumbai and UK.
- Kasambe, R. (2012): Identification of Potential Marine Important Bird Areas in India. *Mistnet*. 13 (4) 13–16.
- Kurup, D.N. and Zacharias, V.J. (1994) Birds of Lakshadweep Islands. *Forktail* 10: 49–64.
- Mathew, D.N. and Ambedkar, V.C. (1964) A bird study trip to the Luccadive Islands. *JBNHS* 61:185–190.
- Mathew, D. N., Mathew, G. and Gandhi, T. (1996) Breeding season of the terns *Sterna fuscata* and *Anous stolidus* in the Lakshadweep. *JBNHS* 93: 507–510.
- Pande, S., Sant, N.R., Ranade, S.D., Pednekar, S.N., Mestry, P.G., Kharat, S.S. and Deshmukh, V. (2007) An ornithological expedition to the Lakshadweep archipelago: Assessment of threats to pelagic and other birds and recommendations. *Indian Birds* 3(1): 4–14.
- Prince, M. (2011) Some observations from Lakshadweep and Laccadive Sea off Kerala Coast. *Indian Birds* 7(3): 63–65.
- Rodgers, W.A., Panwar, H.S. and Mathur, V.B. (2000) Wildlife protection area network in India. A review. Wildlife Institute of India. Dehra Dun. Pp.44.